MATH 1340
Probability Assignment
Winter 2013

The following is a list of the 10 villages in Michigan with the lowest population as of the 2010 Census.

A. If a <u>sample of size 2</u> is chosen at random from the list of 10 villages below, what is the probability that the sample mean is greater than the population mean? (Hint: you may want to start by listing out all possible samples of size 2 that are possible and finding the sample mean for each of those samples.)

B. If <u>1 village</u> is chosen at random from the list of 10 villages below, what is the probability that the chosen village is within 200 miles of Detroit? (Please use Google Maps to calculate the mileage.)

C. <u>Type</u> a 1-page (250 word) paper describing your what you learned from this assignment and how you might use it in the real world. For example, if you were starting a business and wanted to reach as many people as possible, how could you use the information you gained in this assignment to determine whether it might be worthwhile to accept this assignment or move on to somewhere else? Or you could comment on sampling methods that you might use in this case – would cluster or stratified sampling work best? Just make sure that your paper touches on concepts that we have discussed in this course so far.

Village	Population	# of miles from Detroit
Twining, Michigan	181 people	
Melvin, Michigan	180 people	
Pierson, Michigan	172 people	
Ahmeek, Michigan	146 people	
Alpha, Michigan	145 people	
Free Soil, Michigan	144 people	
Harrietta, Michigan	143 people	
Forrestville, Michigan	136 people	
Eagle, Michigan	123 people	
Turner, Michigan	114 people	

Answer Key

Table of filled out mileage numbers:

Village	Population	# of miles from Detroit
Twining, Michigan	181 people	157
Melvin, Michigan	180 people	74.8
Pierson, Michigan	172 people	184
Ahmeek, Michigan	146 people	572
Alpha, Michigan	145 people	514
Free Soil, Michigan	144 people	270
Harrietta, Michigan	143 people	227
Forrestville, Michigan	136 people	111
Eagle, Michigan	123 people	107
Turner, Michigan	114 people	160

Table of sample means for Problem A:

180.5	176	159	145.5	144.5	143.5	139.5	129.5	118.5
176.5	163	158.5	145	144	140	133	125	
163.5	162.5	158	144.5	140.5	133.5	128.5		
163	162	157.5	141	134	129			
162.5	161.5	154	134.5	129.5				
162	158	147.5	130					
158.5	151.5	143						
152	147							
147.5								

A. $P(\bar{x} > \mu = 148.4) = \frac{20}{45}$

B. $P(\# \text{ miles is from Detroit} > 200 \text{ miles}) = \frac{6}{10}$